

Description:

AB 32 will require that statewide GHG emissions in 2020 be reduced by about 27% from business-as-usual, or about 12% from 2004. Emissions from light-duty vehicles, however, are only projected to decrease by about 18% from BAU, and actually increase by 6% from 2004, even with the AB 1493 vehicle emission standards. But considering that every ton of vehicular GHG emissions has an associated fuel cost of about \$300, there is tremendous untapped potential for further emission reductions in transportation, based on fuel savings alone.

The “cost-effectiveness” criterion of AB 1493 implied a marginal technology cost limit of about \$1.28/gal (equiv. \$144/MT, 2006 dollars, based on a \$1.74 fuel price in 2004, 5% discount rate, and 7% inflation adjustment). The same criterion applied to more recent fuel prices implies a \$1.87/gal (\$210/MT) cost-effectiveness limit, but the projected marginal compliance costs of AB 1493 are less than about \$0.77/gal (\$87/MT). Although more expensive technologies would undoubtedly be cost-effective, standard-based policies such as AB 1493 cannot be premised on such technologies because standards do not directly control marginal costs and must therefore be biased toward extreme cost conservatism.

Vehicle feebates can be employed either with or in lieu of standards to capture the untapped potential for transportation emission reductions. From the perspective of a regulated firm, a feebate is very similar to a tradable standard. Rather than buying or selling credits based on how the emission performance of its vehicles compares to a standard, the firm incurs fees or accrues rebates based on its performance relative to a “pivot-point” emission level. In either case, marginal incentives are determined by an emission price, which limits regulation-induced marginal technology costs. But whereas a tradable standard regulates fleet-average emissions while allowing market prices to vary unfettered, a feebate regulates the emission price while the pivot point floats to maintain revenue neutrality. The regulated price would create a stable investment environment in which companies know that their long-term investments in emission-reducing technologies will not be undermined by price erosion and regulators do not have to be as reliant on speculative, long-range price projections.

In essence, a feebate is a refunded emission tax in which a tax is levied on projected lifecycle vehicle emissions and is refunded according to some allocation formula. As with allowance allocation under a standard, there are many ways that refunds can be allocated. If a feebate uses the same proportionate allocation as a standard, and if the emission price is the same, then the feebate will be equivalent to the standard in the sense that fees and rebates would be the same as trading transactions. However, feebate policy options should not be limited to traditional, LEV class-based allocation because of the very large distributional imbalances that would result at high emission prices. (The attached technical materials illustrate these distributional characteristics and discuss alternative allocation methods.)

Emission Reduction Calculations and Assumptions:

The accompanying spreadsheet includes the following data and calculations:

- (1) “TechCost” worksheet: Projected AB 1493 compliance technology costs, based on the August 2004 ISOR and September 2004 Addendum
- (2) “FuelPrice” worksheet: Ten-year fuel price trends in California, based on data published by CEC and corrected for inflation
- (3) “MY2002fleet” worksheet: Model-Year 2002 California vehicle fleet characteristics, from the ARB database used to calculate the AB 1493 standards
- (4) “CO2std” worksheet: Illustration of the distributional characteristics of the AB 1493 regulations applied to a hypothetical MY 2016 vehicle fleet
- (5) “Feebate” worksheet: Illustration of a feebate using the same LEV-based allocation as AB 1493 and constructed to exhibit the same operational characteristics
- (6) “Feebate2” worksheet: Illustration of an alternative refund allocation that mitigates distributional costs
- (7) “Feebate3” worksheet: Illustration of the alternative refund allocation method, with the emission price increased to the cost-effectiveness limit

The tables in the TechCost worksheet are excerpted from the August, 2004 Initial Statement of Reasons for the AB 1493 regulations and the September 2004 Addendum<sup>1</sup>. These show potential emission reductions and projected costs (in 2004 dollars) for a variety of technology options that were considered in the rulemaking. The highlighted rows correspond to technology packages that were selected to represent “maximum feasibility” in developing the vehicle emission standards. The rightmost column shows, for each representative vehicle, the average cost of the alternative technology packages selected for that vehicle. The maximum of these average values is \$0.72/gal, applied to lifecycle fuel consumption. In 2006 dollars, this is \$0.77/gal, or \$87/MT. This represents a conservative upper bound on marginal technology costs of AB 1493, because manufacturers are free to use the lower-cost technology packages or any other compliance mechanism (including trading), and long-term cost projections more often than not tend to overstate actual costs. Moreover, not all vehicles need to be controlled to the maximum level under the LEV-based standard.

The maximum feasibility mandate of AB 1493, as interpreted by CARB, required that marginal technology costs not exceed fuel savings. Based on a \$1.74/gal (2004) fuel price, and factoring in a 5% discount rate (amortized over a 16-year vehicle life), the

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<sup>1</sup> CARB, 2004a. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Adoption of Regulations to Control Greenhouse Gas Emissions From Motor Vehicles, August 6, 2004. California Environmental Protection Agency, Air Resources Board.

<http://www.arb.ca.gov/regact/grnhsgas/grnhsgas.htm>

<http://www.arb.ca.gov/regact/grnhsgas/isor.pdf>

CARB, 2004b. Addendum Presenting and Describing Revisions to: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Adoption of Regulations to Control Greenhouse Gas Emissions from Motor Vehicles, September 10, 2004. California Environmental Protection Agency, Air Resources Board.

<http://www.arb.ca.gov/regact/grnhsgas/grnhsgas.htm>

<http://www.arb.ca.gov/regact/grnhsgas/addendum.pdf>

present (2004) value of fuel savings is about \$1.20/gal. (Applying a 7% CPI increase over two years<sup>2</sup>, this translates to \$1.28/gal, or \$144/MT, in 2006 dollars.) Many of the “Long Term” technologies in the TechCost worksheet (e.g., moderate or advanced Hybrid Electric Vehicles, indicated as “HEV”) are within the \$1.20/gal limit, but were considered to be “infeasible”, according to ARB’s stringent feasibility criteria, for the purpose of establishing the standard. (Manufacturers are free to employ such technologies, but the extra emission credits that they generate would allow offsetting emission increases in other vehicles, so their superior emission performance would not impact aggregate statewide emissions.)

The FuelPrice worksheet calculates the cost-effectiveness limit of emission-reducing technologies, according to ARB’s AB 1493 criteria, based on recent prices for regular-grade gasoline. The three-year average price (as of September 10, 2007<sup>3</sup>) is \$2.716/gal (2006 dollars), which translates to a discounted present value of \$1.870/gal (\$210/MT). This is a conservative lower bound on fuel savings valuation, in that it does not take into account fuel price inflation, energy security risks, and climate change impacts of fuel consumption.

The AB 1493 cost-effectiveness criterion would currently imply a marginal cost limit of about \$1.87/gal. But although the AB 32 mandate is similar to AB 1493 it does not define cost-effectiveness in the same way, so the limit may be higher or lower than \$1.87/gal in the context of AB 32. It may be higher if environmental externalities or energy security risks are accounted for (e.g. a discount factor less than 5% might be used to account for fuel price inflation). On the other hand, it might be lower if a \$1.87/gal incentive would be more than what would be required to fully exploit available and emerging technologies such as plug-in hybrids.

The principle of feebates will be illustrated in relation to a baseline scenario in which the AB 1493 regulations are applied to a hypothetical MY 2016 market. The regulations give manufacturers unlimited flexibility in how they may comply. Some may choose to make no improvements in some vehicles, and rely on emission credits to offset their emissions. Others may choose to improve vehicles that already meet the standard, so that they can sell surplus credits. The following comparisons are based on a MY 2016 California market that is identical to the MY 2002 market in terms of the relative distribution of sales volume and emissions between vehicle models. The MY 2002 fleet characteristics are summarized in the MY2002fleet worksheet. (This is the same data that was used to calculate the AB 1493 standard, except that some minor classification errors have been corrected, as indicated by the highlighted cells.<sup>4</sup>) The hypothetical MY 2016 fleet characteristics are tabulated in the CO2Std worksheet. The 2016 sales data is the same as the 2002 data, but uniformly scaled by a factor of 1.23 to account for a 1.5%

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<sup>2</sup> U.S. Department of Labor, Bureau of Labor Statistics  
<http://www.bls.gov/cpi/>

<sup>3</sup> Data source: California Energy Commission.  
Weekly Transportation Fuels Trend (accessed Sept 11, 2007)  
<http://www.energy.ca.gov/gasoline/index.html>  
[http://www.energy.ca.gov/gasoline/retail\\_gasoline\\_prices.html](http://www.energy.ca.gov/gasoline/retail_gasoline_prices.html)

<sup>4</sup> Data provided by ARB (from Paul Hughes, March 24, 2005).

annual sales growth. The emissions data is also the same as 2002, but uniformly scaled to meet the AB 1493 fleet-average emissions limit. (The same emissions scaling factor is applied to Cars and Trucks, and to all manufacturers, but some sectors may be induced to take on a greater burden of emission reductions, as indicated by trading revenue flows.)

[For the purpose of this analysis, air conditioning credits are not accounted for, so the emission data in the CO2std worksheet is representative of vehicle emissions, excluding air conditioning emissions, under the premise that manufacturers make no improvements in air conditioning. If they make such improvements, the allowed vehicle emissions would increase due to the air conditioning credit, but air conditioning emissions would decrease by about the same amount.]

Under an emission trading system such as the AB 1493 regulations, the market price for emission allowances will tend to equilibrate to the aggregate marginal compliance cost, which is estimated at \$0.77/gal (\$87/MT) applied to lifecycle vehicle emissions. Assuming this price, the per-vehicle trading costs and gains are tabulated in the CO2Std worksheet. Aggregate data is summarized in the table. The total trading revenue flow is \$485 million. Due to the higher emission allowance for Trucks (332 g/mi, versus 205 g/mi for Cars), there is a \$254 million revenue flow from Cars to Trucks (indicating that a greater share of the emission reduction burden might actually shift to Cars).

The Feebate worksheet illustrates the market characteristics of a vehicle feebate that is designed to replicate the performance of the standard. The feebate is equivalent to a refunded emission tax in which a \$0.77/gal tax is applied to lifecycle emissions and is refunded according to the same proportionate allocation formula that AB 1493 uses for allowance allocation (i.e., the per-vehicle refund for Trucks is 62% higher than for Cars). The tax-refund balance is the feebate, a fee if positive and a rebate if negative. [Note: In practice, the lifecycle emissions rating should include at least an estimate of air-conditioning-related emissions, using the same methodology employed for AB 1493.]

The Car and Truck pivot points (i.e., zero-feebate emission levels) in the Feebate worksheet match the standard (205 and 332 g/mi) in the CO2Std worksheet, and the feebate revenue flows are identical to the trading gains and losses under the standard. But the calculation formulas are different. In CO2Std the emission standard values are predetermined constants and the vehicle emission levels are calculated, whereas in the Feebate worksheet the emission levels are pre-specified and the pivot points are calculated. The emission price is fixed in both worksheets, but in practice the trading price under a standard would depend on market conditions and technology costs. The feebate emission price would be fixed, and emission levels would be determined, in part, by the price incentive. Although the two policies appear equivalent, the fixed emission price of the feebate would create a more stable investment climate that would be conducive to the expeditious commercialization of low-carbon transportation technologies.

The feebate is based on the LEV Car/Truck classification, but it is not a multi-class feebate in the conventional sense, in that it is not revenue-neutral within each vehicle class. There is substantial revenue flow between the two classes, just as there would be with emission trading. The Car and Truck refund rates could alternatively be determined independently to achieve revenue neutrality within each class. (Under a comparable standard, trading between the classes would not be allowed and trading prices for Cars and Trucks would vary independently of each other.) But the Truck refund allocation is constrained to be 62% higher than the Car allocation, as is the allowance allocation under AB 1493. To an extent, this disparity is reflective of the intrinsically greater transportation utility and correspondingly greater emissions of Trucks relative to Cars, but the overly simplified LEV allocation formula results in a very large (\$254 million) revenue flow from Cars to Trucks. On the other hand, if an attribute-neutral feebate were employed (uniform per-vehicle refunding across both classes) there would be a much greater (\$708 million) reverse revenue flow from Trucks to Cars.

The political and economic viability of climate change regulations is constrained not only by expected costs and cost uncertainty, but also by distributional disparities between vehicle classes and between manufacturers, which can significantly impact consumer choice and manufacturer competitiveness. Such disparities can be mitigated by using an allocation formula that is more closely representative of vehicles' transportation utility and intrinsic emissions. One approach, illustrated in the Feebate2 worksheet, would be to use weight-proportionate allocation similar to the "regression lines" used to determine the AB 1493 standard (see Figures 6-1 and 6-2 in the ISOR Addendum). This is not the only – or necessarily the best – possible allocation method. Alternative approaches such as various class segmentation methods, or the footprint-based allocation method used by the NHTSA's new LDT standard, might be considered. (A variety of allocation methods is described and modeled, using national-scope MY-2005 data, in a companion document, "Attribute-Based Vehicle Feebates"<sup>5</sup>.) But simple weight-proportionate refunding illustrates the salient features of such alternatives.

In the Feebate2 worksheet, the same emission price is used (\$0.77/gal), so marginal technology incentives are unchanged, but refunds are allocated in proportion to Test Weight (i.e. loaded vehicle weight at which emission performance is tested). As a result, distributional impacts are significantly mitigated, e.g. aggregate fees and rebates are reduced from \$485 million to \$233 million, and the \$254 million feebate revenue flow from Cars to Trucks is diminished and reversed, becoming a \$35 million flow from Trucks to Cars.

The reduced distributional costs could make it feasible to apply an emission price more in line with benefits. The Feebate3 worksheet is the same as Feebate2, except that the emission price is increased from \$0.77/gal, to \$1.87/gal (i.e., \$210/MT), the threshold of cost-effectiveness according to the AB 1493 criterion at current fuel prices. For comparison with the TechCost worksheet, the \$1.87/gal price is about \$1.75/gal in 2004 dollars. All but one of the "Long Term" technologies are within this cost limit, and many of these technologies have the potential of achieving emission reductions of about 50%.

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<sup>5</sup> Available at SSRN: <http://ssrn.com/abstract=1014866>

A feebate policy would not require or guarantee that such reductions are achieved, but unlike an inflexible standard, it would motivate reductions of that order if they can be achieved cost-effectively.

The 18% low estimate for emission reductions from the 165 MMT baseline in 2020 is equivalent to the projected emission reductions under the AB 1493 regulations (see the ISOR Addendum, Table 8.2-1). Per-vehicle emission reductions are greater, about 30% from 2002, but vehicles with this performance would not fully displace California's existing vehicle stock until after 2030. The 30% high estimate for aggregate emission reductions from BAU in 2020 is based on the premise that vehicles with 50% emission reduction from 2002 become predominant by 2016, increasing the projected 18% emission reductions by about a factor of 5/3.

#### Cost-Effectiveness Calculation and Assumptions:

The high estimate (zero) assumes that the emission price is set to \$1.87/gal (\$210/MT) and that manufacturers respond by implementing GHG reduction technologies with maximum marginal costs of \$1.87/gal. The feebate would create no incentive to commercialize more costly technologies. Note that the feebate does not itself impose any aggregate costs (it is revenue-neutral); the only aggregate cost to the regulated industry is that of regulation-induced technology. Also, note that the \$1.87/gal technology cost is only representative of the most expensive incremental technologies that are deployed. Many deployed technologies would have significantly less cost, so although marginal net costs may be zero, average net costs would be negative.

The low estimate (-\$124/MT) is equivalent to -\$1.10/gal. This is the difference between the projected maximum trading price under AB 1493 (\$0.77/gal) and the conservatively-estimated marginal benefit of fuel savings (\$1.87/gal).

The Climate Action Team has estimated the AB 1493 cost-effectiveness in 2020 as -\$177/MT, the balance of \$44/MT in costs and \$221/MT in benefits<sup>6</sup>. In terms of fuel price equivalents, the costs and benefits are \$0.39/gal and \$1.97/gal, respectively. The \$0.39/gal value is lower than the \$0.77/gal value used here because it represents average costs of the AB 1493 regulations for the entire vehicle stock in 2020 (including those vehicles with the least expensive compliance technologies), whereas the \$0.77/gal estimate is only reflective of marginal costs (i.e., highest incremental costs) for new vehicles purchased in or after 2016. The CAT's \$1.97/gal benefit estimate is based on an excessively conservative gasoline price forecast of \$2.28/gal in 2020, but is nevertheless higher than the \$1.87/gal estimate used here (perhaps because it reflects a wider range of benefits than just fuel economy).

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<sup>6</sup> UPDATED MACROECONOMIC ANALYSIS OF CLIMATE STRATEGIES PRESENTED IN THE MARCH 2006 CLIMATE ACTION TEAM REPORT. PUBLIC REVIEW DRAFT, SEPTEMBER 7, 2007  
[http://www.climatechange.ca.gov/events/2007-09-14\\_workshop/2007-09-14\\_REVIEW\\_DRAFT\\_MACROECONOMIC.PDF](http://www.climatechange.ca.gov/events/2007-09-14_workshop/2007-09-14_REVIEW_DRAFT_MACROECONOMIC.PDF)

Implementation Barriers and Ways to Overcome Them:

(1) If the transport sector is integrated into a broad-based, economy-wide cap-and-trade system, then a feebate may provide no benefit because the additional emission credits generated by emission reductions in the transport sector would result in offsetting emission increases in other sectors. In essence, the feebate would induce the transport sector to take on a greater share of the burden for emission reductions without reducing aggregate emissions. Moreover, the emission price under a multi-industry cap-and-trade system would probably be only a fraction of the cost-effectiveness threshold for transportation (\$210/MT), and hence may be incapable of inducing significant reduction of transportation emissions. For these reasons, it may not make sense to include transportation in a broad-based cap-and-trade system.

(2) A state-level feebate might be susceptible to leakage because vehicle buyers might be inclined to cross state borders to avoid fees or take advantage of rebates. The feebate policy may need to be administered through vehicle registration processes to ensure that feebates are applied only to in-state registered vehicles. (Even under a national feebate program it may be advantageous to use registration processes to ensure state-level revenue neutrality. Otherwise, the feebate might induce large interstate or interregional revenue flows that would serve no policy purpose.)

(3) The feebate is based on projected lifecycle vehicle emissions, but predicting emissions of flex-fuel and plug-in hybrid vehicles would be problematic because one does not know in advance how much of each kind of fuel a vehicle will use. One way to address this problem would be to combine vehicle feebates with a refunded tax on fuels. Both policies would be revenue-neutral in their respective regulated sectors, so emissions would not be double-counted. The vehicle feebate would be premised on an estimate of lifecycle emissions based on industry-average emission intensity of fuel, and the fuel incentive would act a kind of “correction factor” (positive or negative) to account for differences between actual fuel use and the assumed industry-average fuel mix. In principle, electricity (for grid-connected hybrids) could be treated as any other fuel if there were some mechanism for separately metering and accounting for vehicular electricity consumption. This would incentivize substitution of electricity for liquid fuels, to the extent that electricity is less emissions-intense. But without separate metering it may not be possible to include electricity in the fuel incentive. (It should be noted that the same issues relating to fuel mix apply to standards. AB 1493 uses crediting mechanisms to account for differences in fuels.)

(4) Perhaps the most significant implementation barriers are matters of perception. For example, policy makers may believe that monetary incentive policies such as feebates would not perform any better than a tradable standard because incentives are not as “stringent” and do not impose an absolute limit on emissions or emission intensity. This perception can be overcome by recognizing that from the perspective of a regulated firm, emission trading is equivalent to a monetary incentive based on the



market emission price. A standard will not outperform a feebate unless its market price is higher than the feebate's mandated price. Standards must be biased toward extreme cost conservatism to ensure cost-effectiveness under long-range predictive scenarios, whereas a feebate allows regulators to set the emission price at the threshold of cost-effectiveness; thus a feebate could create much greater incentives for cost-effective emission reductions.

(5) Feebates have been strongly opposed by industry because they are perceived as an "SUV tax". This is more than just a perception. Feebate proposals such as California's AB 493 legislation (Ruskin, 2007) can be reasonably construed as SUV taxes, in the sense that practically all fees would be paid by light-duty trucks and practically all rebates would accrue to cars. Attribute-based feebates can eliminate or significantly mitigate this distributional disparity, because a vehicle's feebate would be determined mainly by how its emissions performance compares to other vehicles in the same utility class. An attribute-based feebate policy that does not unnecessarily constrain consumer choice or alter the competitive balance between manufacturers, and which further eliminates the price uncertainty, volatility, and transaction costs of emission trading, may be attractive to industry stakeholders.

(6) Attribute-based feebates are opposed by some stakeholders because of the perception that a policy that imposes a fee on a small car, while awarding a rebate to a truck with comparatively worse fuel economy, is perverse. This perception can be overcome by recognizing that the truck receives a rebate because of its superior emissions performance in relation to other vehicles in the same utility class, and that its rebate is primarily financed by fees on other trucks, not on cars. (The weight-proportionate refunding method described above would actually induce some feebate revenue flow from Trucks to Cars, even with the higher refunds awarded to Trucks. Alternative class-partitioned feebates could eliminate any revenue flow between large and small vehicles.)

(7) A feebate that uses weight-proportionate refunding, as illustrated in the accompanying spreadsheet (Feebate2 and Feebate3 worksheets), would be much more effective than other attribute-based feebates (footprint- or volume-based) at mitigating distributional costs; but this type of feebate would meet opposition because of the perception that it could incentivize upweighting. The same argument applies to standards with weight-proportionate allowance allocation. This concern was articulated in the AB 1493 Final Statement of Reasons<sup>7</sup> (agency response to comment #322), which stated that "... a weight-based standard, instead of simply encouraging the addition of emission-reduction technology to achieve compliance, allows a mixed strategy of both adding some emission-reduction technology and adding weight. This weight-based standard therefore increases the possibility of a long-term gradual weight increase that could undermine the objective of the proposed regulation to achieve climate change emission reductions." The NHTSA similarly argued, in developing its new footprint-based LDT

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<sup>7</sup> CARB, 2005. Regulations to Control Greenhouse Gas Emissions from Motor Vehicles: Final Statement of Reasons, August 4, 2005. California Environmental Protection Agency Air Resources Board <http://www.arb.ca.gov/regact/grnhsgas/grnhsgas.htm>, <http://www.arb.ca.gov/regact/grnhsgas/fsor.pdf>



standard, that vehicle weight could “be tailored for the sole purpose of subjecting a vehicle to a less stringent target”.<sup>8</sup> These concerns are based on the implicit notion that weight can be increased without increasing emissions – otherwise the upweighting incentive of the “less stringent target” would be neutralized by heavier vehicles’ greater emissions. The perception that weight-proportionate allocation would induce upweighting can be overcome by recognizing that the weight dependence functions to neutralize, not invert, the extremely strong downweighting incentive exhibited by attribute-neutral allocation, making it possible to focus regulatory incentives more exclusively on emission-reduction technology. Furthermore, weight proportionality and weight independence are not mutually exclusive options; the refunding method can be constructed to achieve any intermediate degree of downweighting incentive between attribute-neutral and weight-proportionate refunding.

(8) Weight-proportionate refunding, and other forms of weight-based refunding, are also opposed because they would not create incentives for using advanced lightweight engineering materials, which can provide the same functional utility as heavier, conventional materials. Again, the same argument applies to weight-based standards. For example, the NHTSA stated that “By using vehicle footprint in lieu of a weight-based metric, we are facilitating the use of promising lightweight materials that, although perhaps not cost-effective in mass production today, may ultimately achieve wider use in the fleet, become less expensive, and enhance both vehicle safety and fuel economy”. This perception can be overcome by recognizing that a weight-based feebate that functions to neutralize weight-changing incentives (for either upweighting or downweighting) would be compatible with a complementary policy that is focused exclusively on incentivizing substitution of advanced lightweighting materials for conventional materials. The two policies, in combination, would circumvent the tradeoff between weight and technology incentives, allowing maximum cost-effective incentives to be simultaneously applied to both. [One way to accommodate lightweight materials in a weight-based feebate would be to award “weight credits” for qualified materials based on their equivalent utility characteristics. For example, if 1000 lbs of steel is replaced by 600 lbs of functionally equivalent, high-strength composite material, then the 400-lb difference would be added to the vehicle weight for the purpose of determining the feebate.]

#### Potential Impact on Criteria and Toxic Pollutants:

This issue is addressed in Section 12.4 of the ISOR, “Combined Effect on Criteria Pollution Emissions,” which concludes that “By any measure, the combined effect is small.” Furthermore, criteria pollutants could be explicitly included in the feebate program by applying an emission price to such emissions, in addition to the GHG price.

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<sup>8</sup> (NHTSA) National Highway Traffic Safety Administration, 2006a. Average Fuel Economy Standards for Light Trucks, Model Years 2008–2011 (Final rule).  
<http://www.nhtsa.gov/> (Select Laws/Regulations → CAFE → Final Rule.).